REMARKS

Claims 1-33 are pending in the application. Claims 1, 27, 32, and 33 are independent claims. Claims 1-33 stand rejected by the examiner. Claim 34 has been added. Assignee traverses the instant claim rejections.

Interview Summary

Assignee's representative would like to thank examiner Cam Y. T. Truong for the courtesies extended to assignee's representatives, David Bultman, Fonda Daniels-Farrar, and John Biernacki during the telephone interview on July 20, 2006. The interview discussed claim 1's limitation that the first data in the first data page is configured to store a second key that is a duplicate of the first key and that corresponds to second data stored on a second data page. Figure 11 of Hara was discussed in the context of such limitations of claim 1. Claims 25 and 26 were also discussed. The remarks and the amendments contained herein further summarize the interview.

Claim Rejections – 35 USC § 101

Claims 1-26 stand rejected under 35 USC § 101 because the language of the claim raises a question as to whether the claim is directed merely to an abstract idea. Assignee respectfully disagrees but to expedite prosecution of the application, assignee has amended claims 1-26 to recite a computer-implemented information processing system involving a database system and that the first, second and third keys of claim 1 are used for searching a set of data records. In view of the foregoing, assignee submits that the instant rejection has been traversed and that the claims should proceed to issuance.

Claim Rejections – 35 USC § § 102 and 103

Claims 1, 3, 5-9, and 11-26 stand rejected under 35 USC § 102 as being anticipated by Hara (U.S. Patent No. 6,571,250). Claims 2 and 4 stand rejected under 35 USC § 103 as being unpatentable over Hara in view of Li (U.S. Patent No. 6,647,381). Claims 10, 27-33 stand rejected under 35 USC § 103 as being unpatentable over Hara in view of Ishak (U.S. Patent No. 5,475,837). Assignee traverses the instant rejections.

Claim 1 is directed to a computer-implemented information processing system involving a database system with a plurality of data records accessible through a B tree structure, wherein a set of the data records have duplicate keys. More specifically, claim 1 recites that first data in a first data page is configured to store a second key which is a duplicate of a first key and which corresponds to second data stored on a second data page. The second data is configured to store a third key that is a duplicate of the first key and that corresponds to third data. The first key points to the second key, and the second key points to the third key. The first, second and third keys are used for searching the set of the data records.

As a non-limiting example of claim 1, figure 8 of assignee's specification provides an illustration where a B-tree has duplicate keys on data pages. In this example, the key "42" (shown at 400) has five unique values, in other words the key "42" is duplicated multiple times (as shown at 401, 402, 403, 404, 405). Key "42" points to the data and first duplicate key 401 that are located on a data page. The first duplicate key 401 points to the next duplicate key 402 that is on a different data page, and so on.

The cited reference Hara does not disclose the limitations of claim 1, such as claim 1's limitations that second data is configured to store a third key that is a duplicate of the first key and that corresponds to third data, and that the first key points to the

second key, and the second key points to the third key. Hara lacks any details regarding such limitations of claim 1.

For example figure 11 of Hara does not disclose such limitations of claim 1. Figure 11 is used in Hara to describe "the configuration of a conventional B-tree having many duplicate key data" (see Hara at column 3, lines 66-67) and the problems of such a conventional B-tree. Figure 11 is described as follows at column 2, lines 36-62 in Hara:

> As shown in FIG. 11, there are the following problems with the B-tree index having a number of same keys. In the B-tree index shown in FIG. 11, table data information relating a key is managed by one leaf entry 16. The leaf entry 16 includes a key 14, table data information 18 (data record identifier) relating to the key value, and a number 17 (number of duplication) of pieces of table data information 18 relating to the key value. The table data information 18 is arranged in an ascending order in a list form of duplication. In this storage system, when the number of duplication of a key increases, the length of a leaf entry cannot be stored in a leaf node 12. As a result, the table data information for one key has to be divided into a plurality of leaf entries, and stored in a plurality of nodes. In the example shown in FIG. 11, the entries of the keys `28` are stored separately in three nodes, that is, leaf nodes N4, N5, and N6. In this structure, the entries of the keys `28` are bottlenecks in scanning leaf nodes using a pointer in the horizontal direction corresponding to the range search. Furthermore, the key 14 contained in an upper node 13 stored in the root node 10 and the upper node 13 has also to be a key in the table data information in addition to `28`, thereby causing the problem that the number of a root node 10 and the upper node 13 increases. As a result, a duplicate key lowers not only the performance of the access process on a duplication key itself, but also the access performance of the entire B-tree index, and the storage efficiency.

This passage from Hara is only illustrating a conventional B-tree index and problems associated with a conventional B-tree index. As shown by this passage, Hara does not disclose the limitations of claim 1, such as claim 1's first key pointing to a second key which points to a third key, wherein the second key and the third key are

duplicates of the first key. Because Hara does not disclose the limitations of claim 1, Hara cannot anticipate claim 1. Accordingly claim 1 is allowable and should proceed to issuance. Because claim 1 is allowable, the dependent claims of claim 1 are also allowable over Hara.

With respect to newly added dependent claim 34, claim 34 recites that the third key of claim 1 points to the second key, and that the second key points to the first key. This allows the links between the keys to be bi-directional so as to allow find-backward operations as well as a find-forward operations. Hara does not disclose the limitations of claim 34. Accordingly claim 34 is allowable for this additional reason and should proceed to issuance.

Independent claims 27, 32, and 33 recite that first data in a first data page is configured to store a second key which is a duplicate of a first key and which corresponds to second data stored on a second data page. The second data is configured to store a third key that is a duplicate of the first key and that corresponds to third data. The first key points to the second key, and the second key points to the third key. As discussed above, Hara (whether viewed alone or in combination with the other cited references) does not disclose such limitations of these claims. Accordingly claims 27, 32, and 33 are allowable and should proceed to issuance.

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CONCLUSION

For the foregoing reasons, assignee respectfully submits that claims 1-33 are allowable. Therefore, the examiner is respectfully requested to pass this case to issue.

Respectfully submitted,

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By: _____

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